

Amendments to the Specification

Please amend paragraphs [0069], [0174], [0191], [0199], and [0201] as follows:

[0069] All complex-basis-function-data streams 214 are routed to a nonlinear predistorter 224, which may be omitted if nonlinear compensation is to be omitted from transmitter 100. Nonlinear predistorter 224 includes a plurality of equalizers (EQ) 226, with one equalizer 226 being provided for each complex-basis-function-data stream 214. **Fig. 1** **Fig. 2** labels equalizers 226 as being associated with a 2nd-order basis function, a 3rd-order basis function, and so on up to a (K+1)th-order basis function. Each of equalizers 226 is a complex equalizer, like an equalizer 1200 shown in more detail in Fig. 12, and outputs from each equalizer 226 are combined together in adders 228 to form a complex-filtered-basis-function-data stream 230. Data stream 230, which serves as a nonlinear-predistorted-compensation stream, is routed to the subtraction inputs of combining circuit 220.

[0174] Fig. 15 shows a flow chart of subprocess 1500. Generally, subprocess 1500 is configured for compatibility with the Wiener-Hammerstein HPA model. In particular, nonlinear distortion is assumed to be in the form of higher-ordered harmonics of the signal being amplified. The signal being amplified at amp 142 in this model is now closely matched to the "ideal" signal that drives basis-function-generation section 1600 due to the above-discussed linear compensation. And, basis-function-generation section 1600 generates higher-ordered harmonics of this signal. Nonlinear predistorter 224 filters these higher-ordered harmonics, where they are then combined

together with the ideal signal in ~~an inverse a subtractive~~ fashion.

[0191] Task 1128 couples correlation engine (CE) 280 to correlate delta-heat signal 216 with delta-coefficient signal 279 by making the appropriate selections at multiplexers 270 and 278. Then, task 1130 performs a time alignment optimization operation. In particular, delta-heat signal 216 is delayed by making increasingly accurate delay estimates until convergence is reached where maximum correlation results are observed when delta-heat signal 216 is correlated with delta-coefficient signal 279. An optimizing algorithm similar to that discussed above in connection with Fig. 6 may be used in task 1130, or another optimizing algorithm may also be used. At this point, delta-heat signal 279 has been brought into time alignment at the middle of adaptation engine 1300. Changes in the heat of HPA 136, as indicated by the power of the forward-data stream, track changes in the filter coefficient for the middle tap to the maximum extent possible.

[0199] Accordingly, after task 404 a task 406 obtains a residual-nonlinear-EVM value. The residual-nonlinear-EVM value is an estimate of the amount of residual distortion remaining in HPA-RF-analog-amplifier signal 117 after linear and nonlinear compensation that is due to nonlinear distortion. Task 406 may, for example, obtain the residual-nonlinear-EVM value by controlling multiplexers 270 and 278 so that the error stream 276 is correlated with itself in correlation engine 280, then do at least two correlations. One of the two correlations will measure the error signal resulting from the analog signal that is input to HPA 136 and the other will measure the error signal resulting from the analog signal that is output from HPA 136. Of course, timing, phase alignment, and gain adjustments may be performed as

described herein prior to each correlation. Desirably, suitable convergence criteria are used for the two correlation operations so that the effective-error level of error stream 276 is significantly increased decreased as discussed above.

[0201] Following task 406, a task 408 evaluates whether the residual-nonlinear-EVM value is excessive when compared to a predetermined value. An excessive value may result from an aging but not yet failed HPA 136, power supply aging, operation at extreme temperature, or a variety of other scenarios. If the residual-nonlinear-EVM value is excessive, then task 408 ~~provides~~ provides peak-reduction-feedback signal 114 to peak-reduction section 110. Feedback signal 114 is based upon the residual-nonlinear-EVM value obtained above in task 406. In response to feedback signal 114, peak-reduction section 110 will alter the peak reduction it applies to the forward-data stream as discussed above. In particular, when an excessive residual-nonlinear-EVM value is detected, peak reduction is increased so that HPA 136 may operate at a greater backoff, which will lead to reduced nonlinear distortion. The increase in peak reduction will likewise increase linear distortion, but should also decrease nonlinear distortion somewhat. Transmitter 100 will henceforth operate with less nonlinear distortion but more linear distortion. Reception will gracefully degrade, but spectral regrowth will be substantially prevented. In addition, task 408 may activate alarms or otherwise automatically send control messages indicating the excessive residual-nonlinear EVM condition.